MARSHALL STAR

Marshall Space Flight Center *May 24, 2001*

NASA awards $767 million in SLI contracts

NASA/Marshall release

NASA announced on Thursday the first round of contract awards in an agency initiative to find a more affordable and reliable highway into space. The Space Launch Initiative (SLI) is a research and development effort designed to substantially improve safety and reduce the high cost of space travel.

The studies initiated with these awards are not intended to provide a specific vehicle design. This first step marks the beginning of a process that will lead to the development of a common set of alternative technologies that NASA will make available to all U.S. companies. These cutting-edge developments will be used for future government and commercial launch systems and space transportation operations.

The SLI investment is expected to pay off with full-scale spacecraft development options by mid-decade.

"A second-generation reusable launch vehicle will open up the space frontier and significantly improve life on Earth," said Marshall Center Director Art Stephenson. Marshall is leading the program for NASA.

"The Space Launch Initiative is a comprehensive research and development effort that provides technology developments that dramatically increase the safety, reliability and affordability of space transportation systems," Stephenson added. "Through this new initiative, NASA's mission requirements will be met more efficiently, the U.S. launch industry can better compete in the international

*See **SLI Contracts** on page 6*

Center director awarded honorary doctorate

Art Stephenson delivers UAH commencement address

Marshall Center Director Art Stephenson, delivered the commencement address for the 2001 class at The University of Alabama in Huntsville (UAH) May 13. Stephenson also was awarded an honorary doctorate degree for his lifetime of scientific achievement.

UAH Photo by Susan Carlson

Stephenson advises students to live their lives to make a difference.

Leading one of NASA's largest field installations, Stephenson administers a broad range of research and development activities, along with more than 6,500 civil service and contract employees and an annual budget of $2.3 billion.

Since joining Marshall in 1998, he has overseen the Center's work on critical NASA initiatives such as development of new reusable launch vehicles, research in microgravity, and operations support for science payloads aboard the International Space Station.

Stephenson also led the Center during a period highlighted by the launch and beginning of successful operations of the Chandra X-ray Observatory — the world's most powerful X-ray telescope.

"It was an honor to be asked to deliver the 2001 commencement address. I wanted to share my experiences and encourage them to choose a path that stretches their abilities, " he said in a recent interview. "When one stretches, one is confronted with hope that he/she can pull it off, fear that maybe they will not be able to, and joy when they do achieve a goal."

In his address, Stephenson offered the Class of 2001 words to inspire students in their life pursuits. He advised graduates to live

*See **Stephenson** on page 2*

Clears way for flights of Marshall-managed X-37

X-40A free flight test series completed at Dryden

by Marianne Higgins

NASA's X-40A, a prototype of a space-return vehicle, successfully completed its seventh and final test flight May 19, gathering information and clearing the way for future flights of its larger brother, the X-37.

The unpiloted X-40A, an 85-percent scale model of the X-37, 22 feet (6.7 meters) long and about 2,600 pounds (1,180 kilograms), was released from an Army helicopter above NASA's Dryden Flight Research Center, Edwards, Calif. The series of two-minute descents provided valuable information for development and testing of the full-scale X-37 orbital and re-entry vehicle.

"Every X-40A free flight test met or exceeded our expectations," said Susan Turner, X-37 program manager at the Marshall Center. "The most significant thing we learned is that our predictions for X-37 are right on target."

The X-37 experimental space plane is designed to demonstrate technologies in the orbital and reentry environments for next-generation reusable launch vehicles that should increase both safety and reliability, while reducing costs by ten-fold.

Guidance, navigation and control systems of the smaller X-40A are similar to those planned for the X-37. They were tested through complex maneuvers such as pitch, roll and yaw adjustments when the nose is raised, rotated and moved side to side during flight. The vehicle was also released off-centerline, not directly over the landing site, testing the flight computer's ability to maneuver the vehicle to a straight approach towards the landing site.

The Boeing Company, NASA's partner in X-37, made major modifications to the X-40A, on loan from the U.S. Air Force, which also participates in the X-37 program. Dryden conducted the free flight tests with the cooperation of Edwards Air Force Base.

"We successfully performed seven flights, each time pushing the limits," added Turner. "These tests are helping us identify our safety parameters for tests to be performed on the X-37."

On average, the X-40A free flights lasted approximately 75 seconds from release to landing, with the vehicle reaching speeds of more than 300 miles (480 kilometers) per hour.

Unpowered flights of the X-37, when the vehicle will be attached to NASA's B-52 carrier aircraft then released to glide to Earth, could begin as early as 2002, with orbital missions beginning in 2004.

The X-37 government team is led by Marshall, the Air Force Flight Test Center, Edwards Air Force Base in Edwards, Calif., and the Space and Missile Systems Center and the Air Force Research Laboratory in Albuquerque, N.M. The X-37 industry team is led by Boeing, Seal Beach, Calif.

The writer, employed by ASRI, supports the Media Relations Department.

Job Opportunities

CPP-01-035-GF: AST, Structural Dynamics, Team Lead, GS-861-14, Engineering Directorate, Structures, Mechanics, and Thermal Department, Structural Dynamics and Loads Group. Closes June 5.

CPP-01-036-GF: AST, Structural Mechanics, Team Lead, GS-861-14, Engineering Directorate, Structures, Mechanics, and Thermal Department, Strength Analysis Group. Closes June 5.

CPP-01-037-GF: AST, Structural Dynamics, Team Lead, GS-861-14,Engineering Directorate, Structures, Mechanics, and Thermal Department, Structural Dynamics and Loads Group. Closes June 5.

CPP-01-038-GF: Supervisor, AST, Structural Mechanics, GS-861-15, Engineering Directorate, Structures, Mechanics, and Thermal Department, Strength Analysis Group. Closes June 5.

Stephenson

Continued from page 1

their lives as leaders who are driven to make a difference — to have an impact on others. "Live your life to make a difference — at home with the family, as a volunteer and in your profession," Stephenson said.

"Work in a field that has a mission that you really get excited about," Stephenson added. "The worst thing you can do is to work only for money – instead, work for a cause you believe in."

He suggested remembering that an individual does not go through life alone — it's a team effort. "Remember to thank your teachers and mentors, as well as the friend that was always there when you needed support. And remember to thank your parents."

Lastly, he encouraged graduates to "buckle up." "Strap in because now we need to move on to your commencement — a launch into the next exciting phase of your life, which is likely to be quite a ride."

In the same fashion that personnel are polled before a launch, he polled each of the graduating colleges and turned to UAH President Dr. Frank Franz and reported, "Dr. Franz — the Class of 2001 is "Go for Launch."

Shuttle motor ready for test to qualify upgrades

by Lynnette Madison

A full-scale Space Shuttle Reusable Solid Rocket Motor is scheduled to test fire for 123.2 seconds Thursday, May 24, at a Utah test facility.

The test, in Promontory, Utah, at Thiokol Propulsion, an Alliant Techsystems Inc., company, will be used to qualify a new insulation design on the motor's nozzle to case joint that will improve flight safety and help reduce costs of the motor.

The Reusable Solid Rocket Motor Project Office at the Marshall Center tests Flight Support Motors annually to qualify any proposed upgrades or changes to the motor. The static — or stationary — test is part of Shuttle's ongoing verification of components, materials and manufacturing processes required by the Marshall Center, which oversees the Reusable Solid Rocket Motor project.

Support motors are used to evaluate, validate and qualify changes proposed for the Shuttle's Reusable Solid Rocket Motor. On this motor, there are 93 objectives and a total of 576 instrumentation channels being tested. The two-minute test duration is the same length of time that the motors perform during Shuttle flights.

"Full-scale static testing is a key element in our program, providing valuable information on design, process and material changes," said Mike Rudolphi, manager of the Reusable Solid Rocket Motor Project Office. "The rule is: Everything we fly, we static test first."

NASA Photo

Tests on booster motors are a key element of the "test before you fly" maxim of the Reusable Solid Rocket Motor Project.

There are four major certification objectives for the test of Flight Support Motor-9. One of the more important tests is a change in insulation design on the nozzle-to-case joint J-leg. The proposed design change improves the thermal barrier protecting the O-rings on the motor by eliminating polysulfide, a putty-like material applied to the joint surface as the motor is assembled.

During assembly, polysulfide can trap air which may work its way through the putty-like material exposing the thermal barrier to motor combustion gases. The new design incorporates a J-joint - a joint shaped like a J - made of rubber for a better seal and a carbon fiber braided rope. Essentially, it is designed so that as the motor pressure increases, the seal tightens; a proven design used in the case field joints.

The rope, which is downstream of the J-joint, is another safety addition because it absorbs heat should gas seep past the joint. Basically, the new design enhances the primary thermal barrier and adds another thermal barrier with the rope.

The J-joint design should be easier to install and inspect during assembly, require less technical maintenance, and therefore cost less. The upgrade is slated to fly in late 2004.

The firing also will retest a new adhesive that bonds metal parts to phenolic parts in the nozzle; new environmentally-friendly solvents; and demonstrate a new nozzle ablative insulation for the motor.

At 126 feet (38.4 meters) long and 12 feet (3.6 meters) in diameter, the Shuttle's Reusable Solid Rocket Motor is the largest solid rocket motor ever flown and the first designed for reuse. During its two-minute burn at liftoff, each motor generates an average thrust of 2.6 million pounds (1.2 million kilograms).

The test will be conducted in the T-97 bay of the Thiokol test facility, located north of Salt Lake City. Following the test, the data will be analyzed and the results for each objective provided in a final report. The metal case segments and nozzle components will be refurbished for reuse.

The writer, employed by ASRI, supports the Media Relations Department.

Obituaries

Dr. Fritz K. Mueller, 93, of Huntsville died May 15. Mueller was a native of Schalkau, Thuringia in Germany, and a member of the Dr. Wernher von Braun rocket team. He was a pioneer in the development of navigational instruments and guidance and control systems for rockets, with a particular interest in developing highly accurate gyroscopes. Mueller received numerous patents used by the U.S. Army in Redstone, Explorer and Saturn rocket missions and was honored with a doctor of science degree in 1958 from Rollings College in Winter Park, Fla. He was associated with Huntsville Industrial Groups before retiring in 1979. He is survived by his wife, Ursula Mueller.

Marshall sponsors mirror technology review

by Debra Valine

Marshall Center's Space Optics Manufacturing Technology Center hosted a conference May 9-10, for NASA Centers, the Jet Propulsion Laboratory, Department of Defense, industry partners and academia to review mirror technologies under development.

Nearly 100 people attended, including representatives from Goddard Space Flight Center in Greenbelt, Md., NASA's lead center for Next Generation Space Telescope.

Technologies being developed include new enabling techniques for the design, manufacture, test, modeling and control of robust, large-aperture, low-mass, segmented mirrors. The mirrors — that can be rapidly and cost effectively fabricated — are critical to future space observatories, including the Next Generation Space Telescope.

"NASA and the Department of Defense partners have invested $30 million in mirror technology development projects," said Dr. H. Philip Stahl, Marshall's team lead for Next Generation Space Telescope and host of the conference.

These projects include:

- Advanced Mirror System Demonstrator
- Next Generation Space Telescope Mirror System Demonstrator
- Small Beryllium Mirror Demonstrator
- IABG C/SiC Mirror
- UltraMet and Xinetics SicC Mirror Small Business Innovative Research contracts
- Joined Beryllium Mirror Demonstrator
- And the Marshall Center Nickle Replication

"The Small Beryllium Mirror Demonstrator is complete and satisfies all program requirements," Stahl said. "The Advanced Mirror System Demonstrator is on track to demonstrate 15kg/m(2) mirrors, and work on the Next Generation Space Telescope Mirror System Demonstrator is in process."

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Attendees tour the Marshall X-ray Cryogenic Facility in Bldg. 4718.

NASA also has invested $5 million at the Marshall Center for testing cryogenic mirrors. This includes modifications to X-ray/Cryogenic Facility for cryogenic normal incident testing and procurement and/or development of test equipment and facilities.

NASA's Mirror Technology Program has provided focus for mirror system fabrication and associated technology such as actuators and materials.

The Marshall Center's Space Optics Manufacturing Technology Center was formed in May 1999 to be the world leader in space optics manufacturing technology. It supports several critical mirror technologies that:

- Demonstrate large lightweight cryogenic mirror fabrication and testing technology
- Perform cryogenic mirror acceptance and characterization testing
- Support orbital telescope element alignment integration and test and verification and validation efforts
- Mirror fabrication risk identification and mitigation plan
- Investigate candidate mirror/structure materials
- Analyze candidate Next Generation Space Telescope system optical design concepts
- Develop and validate integrated NASTRAN/Thermal/Optical model for predicting mirror/system cryo-performance
- Develop parametric and Next Generation Space Telescope point-design cost models
- Develop test bed to validate phasing algorithms
- Study environmental issues of the second Lagrangian orbital point for a minimum gravity vector field

Technology development program goals include advanced technology and develop technical processes to dramatically reduce cost, schedule and weight for large-aperture optical systems; determine cost scaling laws; mitigate programmatic cost, schedule and weight risk; characterize/understand mirror system performance at ambient and cryogenic temperatures; and provide mirrors for NASA and Department of Defense flight demonstration programs.

The writer, employed by ASRI, is the Marshall Star editor.

Chandra reveals nest of tight binaries in dense cluster

Marshall release

Scientists have gazed into an incredibly dense star cluster with NASA's Chandra X-ray Observatory and identified a surprising bonanza of binary stars, including a large number of rapidly rotating neutron stars. The discovery may help explain how one of the oldest structures in our Galaxy evolved over its lifetime.

The Marshall Center manages the observatory for NASA.

By combining Chandra, Hubble Space Telescope and ground-based radio data, the researchers conducted an important survey of the binary systems that dominate the dynamics of 47 Tucanae, a globular cluster about 12 billion years old located in our Milky Way galaxy.

Most of the binaries in 47 Tucanae are systems in which a normal, Sun-like companion orbits a collapsed star, either a white dwarf or a neutron star. White dwarf stars are dense, burnt-out remnants of stars like the Sun, while neutron stars are even denser remains of a more massive star. When matter from a nearby star falls onto either a white dwarf or a neutron star, as in the case with the binaries in 47 Tucanae, X-rays are produced.

"This Chandra image provides the first complete census of compact binaries in the core of a globular cluster," said Josh Grindlay of the Harvard-Smithsonian Center for Astrophysics (CfA) and lead author of the report that appears in the May 18 issue of Science. "The relative number of neutron stars versus white dwarfs in these binaries tell us about the development of the first stars in the cluster, and the binaries themselves are key to the evolution of the entire cluster core."

Many of the binaries in 47 Tucanae are exotic systems never before seen in such large quantities. Perhaps the most intriguing are the "millisecond pulsars", which contain neutron stars that are rotating extremely rapidly, between 100 to nearly 1000 times a second."

"The Chandra data, in conjunction with radio observations, indicate that there are many more millisecond pulsars than we would expect based on the number of their likely progenitors we found," said co-author Peter Edmonds, also of the CfA. "While there is a general consensus on how some of the millisecond pulsars form, these new data suggest that there need to be other methods to create them."

Chandra observed 47 Tucanae on March 16-17, 2000, for a period of 74,000 seconds with the Advanced CCD Imaging Spectrometer (ACIS). The ACIS X-ray camera was developed for NASA by Penn State and the Massachusetts Institute of Technology. The High Energy Transmission Grating Spectrometer was built by MIT. TRW, Inc., Redondo Beach, Calif. is the prime contractor for the spacecraft. The Smithsonian's Chandra X-ray Center controls science and flight operations from Cambridge, Mass.

For more information, visit the Web at:
http://chandra.nasa.gov

★ ★ ★
Marshall Stars
★ ★ ★

Vaughn to receive Flemming Award for outstanding service

Marshall's Jason A. Vaughn has been named a recipient of the annual Arthur S. Flemming Award. The award, presented by George Washington University in Washington, D.C., honors outstanding men and women in the federal government.

Vaughn, named a winner in the applied science category, will receive the award June 5 in Washington. Winners are selected from all areas of federal service. The award is presented to individuals with three to 15 years of government experience, who have made extraordinary contributions to the federal government.

Vaughn

Vaughn is a materials engineer in Marshall's Engineering Directorate. He has been instrumental in conducting laboratory research and developing technology enabling electrodynamic science missions and high voltage system operation in the space plasma environment. He has developed laboratory systems to simulate the space environment in the laboratory, which is key to conducting detailed research in ground facilities.

He has conducted laboratory research into interactions of high voltage power systems and the space plasma, particularly important in the International Space Station design. His work in electrical properties of thermal control coatings has been key to the success of electrodynamic space missions such as the Tethered Satellite System mission, the TSS-1R reflight, and the Propulsion Small Expendable Deployment System (ProSEDS) experiment, just completing development.

Vaughn's work in developing electrically conductive thermal control coatings and plasma contractors has allowed him to go from basic laboratory research and continue the development process through to the production of the electrodynamic tether for ProSEDS.

Vaughn holds bachelor's and master's degrees in mechanical engineering from Colorado State University in Fort Collins.

SLI Contracts

Continued from page 1

launch market, and our nation's leadership in space will continue to grow in the new century."

NASA first solicited proposals last fall and on Thursday awarded contracts valued at $767 million dollars to 22 contractors, including large and small companies, to allow maximum competition.

The money will be used to develop concepts and the technologies needed to pioneer this extraordinary effort, which is expected to make the vehicle at least 10 times safer and crew survivability 100 times greater, all at one-tenth the cost of today's space launch systems.

These leap-ahead technologies include crew survival systems, advanced tanks and airframe structures, long-life rocket engines and thermal protection systems.

"We've got a clean sheet of paper and a wide open competition," added Stephenson. "The goal is to develop technologies to enable a mid-decade decision regarding the full-scale development of a versatile space transportation system that can be used for both government and commercial services."

Nearly 300 experts throughout NASA, with technical support from the Air Force Research Laboratory, evaluated numerous proposals leading to this initial down-select and awards for this first round of SLI contracts. The awards are for a 10-month base period with options for one or more additional years.

The options enable NASA to measure performance on a yearly basis to make sure the program's ambitious goals are met. This approach also allows for continued competition in key technology areas and for NASA to take advantage of new emerging technologies.

The planned budget for the Space Launch Initiative totals $4.8 billion through fiscal year 2006. Additional solicitations in the fall of 2001 and 2002 will commit significant additional funds to the effort.

All NASA's field centers and the Air Force Research Laboratory are actively participating in the Space Launch Initiative and are vital to its success. The Marshall Space Flight Center is NASA's lead center for SLI. The Air Force Research Laboratory includes research and development facilities at nine U.S. Air Force bases nationwide.

Additional information on NASA's Space Launch Initiative, is available on the Internet at: *http://www.slinews.com*

SLI contracts spread to vendors across country

The following companies were awarded first-round contracts under the Space Launch Initiative (SLI) program. Figures are in thousands of dollars.

• **Boeing, Seal Beach, Calif.**		**$136,064**
– TA-1 Systems Studies	$36,412	
– TA-2 Airframe	$72,678	
– TA-3 Vehicle Subsystems	$15,046	
– TA-4 Operations	$ 6,827	
– TA-8 Propulsion	$ 5,101	
• **Lockheed, Denver, Colo.**		**$ 94,319**
– TA-1 Systems Studies	$36,991	
– TA-2 Airframe	$ 5,226	
– TA-3 Vehicle Subsystems	$25,473	
– TA-4 Operations	$20,965	
– TA-5 IVHM	$ 4,853	
– TA-9 NASA Unique	$ 811	
• **Orbital Sciences, Dulles, Va.**		**$ 53,128**
– TA-1 Systems Studies	$ 5,978	
– TA-10 Flight Demo	$47,150	
• **Futron, Bethesda, Md.**		**$ 1,856**
– TA-1 System Studies	$ 1,856	
•**Northrop/Grumman, El Segundo, Calif.**		**$ 86,591**
– TA-1 System Studies	$ 7,421	
– TA-2 Airframe	$42,705	
– TA-5 IVHM	$36,465	
•**Oceaneering, Houston, Texas**		**$ 5,347**
– TA-2 Airframe	$ 5,347	
• **NC State University, Raleigh, N.C.**		**$ 583**
– TA-2 Airframe	$ 583	
• **Materials Research & Design, Bethlehem, Pa.**		**$ 2,000**
– TA-2 Airframe	$ 2,000	
•**Southern Research Institute, Birmingham, Ala.**		**$ 1,633**
– TA-2 Airframe	$ 1,633	
• **Sierra Lobo, Freemont, Ohio**		**$ 1,590**
–TA-4 Operations	$ 1,590	
• **PHPK Technologies, Westerville, Ohio**		**$ 7,657**
– TA-4 Operations	$ 7,657	
• **Honeywell, Glendale/Torrance, Calif.**		**$ 11,494**
– TA-5 IVHM	$ 5,044	
– TA-9 NASA Unique	$ 6,450	
• **General Kinetics, Chantilly, Va.**		**$ 376**
– TA-6 Upper Stages	$ 376	
• **Rocketdyne, Canoga Park, Calif.**		**$ 65,484**
– TA-6 Upper Stages	$ 2,747	
– TA-8 Propulsion	$62,737	
• **MOOG,East Aurora, N.Y.**		**$ 501**
– TA-6 Upper Stages	$ 501	
• **Pratt & Whitney, West Palm Beach, Fla.**		**$ 125,817**
– TA-6 Upper Stages	$ 424	
– TA-8 Propulsion	$125,393	
• **Universal Space Lines, Newport Beach, Calif.**		**$ 6,545**
– TA-7 Flight Mechanics	$ 6,545	
• **Ohio University, Athens, Ohio**		**$ 4,393**
– TA-7 Flight Mechanics	$ 4,393	
• **TRW,Redondo Beach, Calif.**		**$ 15,544**
– TA-8 Propulsion	$ 15,544	
• **Aerojet, Sacramento, Calif.**		**$ 7,607**
– TA-8 Propulsion	$ 7,607	
• **Andrews Space & Technology, Seattle, Wash.**		**$ 3,017**
– TA-8 Propulsion	$ 3,017	
• **Kistler, Seattle, Wash.**		**$135,400***
– TA-10 Flight Demonstrations	$135,400	
TOTAL		**$766,946**

Center Announcements

McBrayer farewell reception

Everyone is invited to attend a farewell reception honoring Robert O. McBrayer from 5-7 p.m. May 31 in the Bldg. 4203 cafeteria. Tickets are $7.50 and may be purchased from administrative officers. Retirees and others off-site may purchase tickets from Helen Eddleman at (256) 544-4130, Bldg. 4201, room 600H.

Information conference, expo

An Information Assurance Conference and Exposition will be held June 6-7 at the Bob Jones Auditorium in Bldg. 5304 in the Sparkman Center. The Marshall Center, U.S. Army Aviation and Missile Command and the Ballistic Missile Defense Organization are sponsoring the event. Admission is free. To register, visit the Web at: *www.TechnologyForums.com*

Blood pressure screenings

The Marshall Center is offering blood pressure screenings for employees. Employees may stop by the Medical Center in Bldg. 4249 any afternoon between noon-3 p.m. HEMSI paramedics assigned to Marshall will stop at the following designated buildings once during May to perform blood pressure checks. The buildings are 4200, 4203 and 4610. More information on these visits will be available at a later date.

Upcoming Classes

Listening, coping classes

Workshops on coping with tough times and improving listening skills will be held June 28 in Bldg. 4200, room G-13D. Coping with Tough Times: How You Can Turn the Negatives in Your Life into Positives will be from 8-11:30 a.m. The course teaches how to activate the positive forces within you and eliminate the negatives from your personal and professional life. Improve Your On-the-Job Listening and Speaking Skills will be from 12:30-4 p.m. This course teaches how to communicate well with others. For more information, call Chrissa Hall at 544-5468. Register via AdminSTAR.

Clubs and Meetings

Annual stamp show

The Huntsville Philatelic Club will hold its annual stamp show June 2-3 at Huntsville's Tom Bevill Center. This year's show honors the International Space Station. Admission is free. For more information, call Kathy Campbell at 881-0941.

Shuttle Buddies meet

The Shuttle Buddies will meet for breakfast at 9 a.m. May 29 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

Miscellaneous

'Amazing Caves' opens Saturday

Infinitely mysterious and radical by definition, caves are one of Earth's last unexplored frontiers. MacGillivray Freeman's "Journey Into Amazing Caves," narrated by actor Liam Neeson, will be shown in the Spacedome Theater at the U.S. Space & Rocket Center Saturday through Sept. 24. Audiences will follow Dr. Hazel Barton and Nancy Aulenbach through tiny, twisting passages, drop into blue labyrinths of ice, swim through flooded underground vaults, and enter a world so extreme the microscopic creatures who live there are called extremophiles. For information on show times, call 837-3400.

Retirees Association seeks input for space history book

from the Marshall Retirees Association

The NASA-Marshall Center Retirees Association is planning to produce a history book on the rockets and spacecraft developed by the Marshall Center team during the past 50 years.

"The book will be produced as a collector's edition," said Ed Buckbee, president of the Retirees Association. "It will include a comprehensive accounting of those technology advancements and famous space achievements made possible by the Marshall and Redstone employees who helped our nation become the world leader in space exploration."

The book will include tributes, "insider" stories from the men and women who worked here, a complete roster of retirees and former Marshall employees, a chronicle report on all major programs and hundreds of photographs.

Marshall retirees and former employees are being asked for input. "We are asking for personal accounts of an event or events that were particularly memorable to you that contributed to the Marshall Center's accomplishments," Buckbee said. Stories should be between 500 and 1,000 words. These descriptive experiences, which can be anecdotal in nature, should highlight your personal experience in the program you choose to write about." Editors will review submissions for possible inclusion in the book.

Photos — in color or black and white — should be clearly identifiable with a corresponding caption. All submitted material will be returned to its owner after the book is completed.

There is no requirement to buy; however, the Association is encouraging everyone to reserve a copy. Cost is $34.95.

Submit stories and orders for the book prior to July 30 to Turner Publishing Company, ATTN: NASA-Marshall SFC Retirees Book, 412 Broadway, P.O. Box 3101, Paducah, KY 42002-3101.

Employee Ads

Miscellaneous

★ Antique rope bed, 3/4 size with mattress and box spring, $100. Small computer desk, $30. 883-5396
★ Sears Kenmore window air conditioner, 16,000 BTU, requires 220V, $150. 883-9361
★ Worth Copperhead baseball bat, 28-ounce, 32", $40; catcher's gear; old violins, full and 3/4 sizes, several. 534-8186
★ 1960s Schwinn "Fair Lady" girl's 3-speed bicycle, blue, chrome, headlight, all original, $50. 306-0700
★ Indy 500 tickets, two outside 3rd turn, $75 ea. face value. 881-1249
★ Portable typewriter, $25; NordicTrack ab-works, $25; 30" travel bag, wheels, $60; Super 8 projector, $25. 881-2435
★ Computer desk, slide-out keyboard shelf, 2-file drawers, hutch, 2-adjustable shelves, $95. 882-2547
★ Cobra oversize irons, 3-PW regular flex steel, $150. 337-4180
★ Bassett, French Provincial china cabinet and pedestal table, $900. 881-9879
★ Temporary electric pole for construction use. 259-1834
★ Lazyboy rocker/recliners, two, $40/blue one, $20/brown one. 882-2654
★ 1986 172 Chaparral 140 Mercruiser, dry storage kept, $3,300. 881-9879
★ Nordic Track cross-country ski exercise machine, $200. 533-9683
★ Dish 500 satellite system by Dish Networks, new receiver, dual LNB dish, make an offer. 682-5181
★ Truck bedliner for 2000 Chevrolet Silverado, $40; Class II hitch for Chevrolet Lumina, $75. 880-2645
★ Selmer oboe, conservatory model, wood w/ case, music, stand, $1,000. 658-2471
★ Baby items: changing table, exer-saucer, bathtub, bouncy chair, infant gym, 2-snuglis, Medela breast pump, more. 859-8814
★ Windows, wood frame, single pane, and storm windows, aluminum frame, approx. 32"x53", $10 each. 426-4325
★ New LP Conga+instructional video, $275. 881-0755
★ Troybilt tiller, horse model, some repairs necessary, $200. 828-4808
★ Hotpoint washer and dryer, $190; Century toddler car seat, $15; Graco booster car seat, $10. 533-5942
★ Six Spode Georgian green and white plates, will trade for same in blue and white. 882-1097
★ Washer and dryer, $150 for both; couch, coffee table, and end table, $150 for all. 859-5475
★ Pennsylvania House dining table & 4-chairs, cherry, $700; Mahogany tea table, hickory chair, $800. 882-1097

Vehicles

★ 1997 Isuzu Trooper 4WD, 51K miles, leather, CD changer, keyless entry, cruise, $15,000. 564-7599
★ 1989 Mazda B2200, 1.6K miles, cold air, am/fm, bucket seats, wheels, tach, ps, 22 mpg, $2,500. 880-7319
★ 1999 Ford F150 XLT, 4x4, 4-door, SuperCab, all power, a/c, remote start, stepside, AM/FM CD/cassette, $22,000 obo. 721-3506
★ 1998 Cadillac Catera, sage/beige, 49K miles, leather, Bose CD, alum/alloy wheels, memory garage opener, $15,750. 582-5210
★ 1997 Nissan Maxima SE, 5-speed, moon-roof, Bose sound system, new Michelins. 232-3059
★ 1996 Chevy Blazer LT, 4WD, leather, CD, auto, new Michelins, 60K miles, green, $12,500. 256-658-6183 leave msg.
★ 1989 Plymouth Grand Voyager LE, blue/ wood-grain, new Firestone tires, 3.0L, V-6 engine, needs work. $450 obo. 778-9149/ Dave
★ 1995 Ford F150 XLT, 302/V-8, 5-speed, short bed, 4x4, 91K miles, $7,950. 256-753-2278

★ 1989 Honda Civic, 125K highway miles, 35 mpg, air cassette, good tires, one-owner, needs U-joint, $2,500. 852-4948
★ 1990 Ford Aerostar, 3L/V-6, 5-speed manual, $2,500; 1978 Ford F150, 4x4, 300 CID straight-6, 4-speed manual, winch, $2,000. 828-1127
★ 1990 Jeep Cherokee Limited, 4x4, red automatic, 180K miles, $5,500; utility trailer, 5'x8', $300. 859-1947
★ 1990 Toyota Supra Turbo, red w/gray interior, 5-speed, Targa top, garage kept, records available, $5,900. 464-9352
★ 1983 Ford Ranger, diesel, 4-speed, 30+ mpg, $900 obo. 317-8444/Joel
★ 1992 Dodge Caravan, 96.7K miles, new tires, $4,200 obo. 461-8182
★ 2001 Ford Explorer Sport Trac, 15K miles, $21,900. 247-1420

Found

★ Hoop earring, silver filigree, ladies room, Lobby, Bldg. 4200. Call 544-0514/0030 to claim.
★ Sunglasses in ladies restroom, Lobby, Bldg. 4200. Call 544-0514/0030 to claim.

Wanted

★ Little Tykes outdoor play equipment in good condition. 584-7095 after 6 p.m.
★ Kegarator, small frig w/tap on top, holds a keg under countertop. 931-937-6752

Clarification

Riding lawn mowers

An article on lawn mower safety submitted to the Marshall Star by the Marshall Safety Office for the May 17 issue stated, "Drive up and down slopes when operating riding mowers." To clarify, employees should take special care when operating a riding lawn mower on slopes. Always drive directly into or away from slopes to prevent the mower from tipping over.

— ***from the Marshall Safety Office***

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